are not just cognitive or reasoning strategies but include instruments, and techniques for using instruments, that enable the scientist to observe and manipulate objects in the domain. Ian Hacking (1983) pioneered discussion within philosophy of the importance of techniques for intervening in nature. Historians such as Kathryn Olesko have also emphasized the importance of techniques of investigation in delimiting a discipline. She nicely noted that a discipline *disciplines* its practitioners by requiring them to master a particular body of knowledge and techniques of investigation (Olesko, 1991, p. 14). Steven Shapin (1982), focusing on the differences between biometricians and Mendelians, illustrated the importance of differences in techniques and methods in demarcating these two groups of investigators.

In contrast, sociologists and social historians of science tend to focus on the social networks and institutional structures within which scientists work. One role such social units play can be related to the cognitive elements emphasized by philosophers and historians of ideas – they insure compliance with a discipline's mission and accepted methods. Thus, Michael Polanyi introduced "the principle of mutual control," which

> consists . . . of the simple fact that scientists keep watch over each other. Each scientist is both subject to criticism by all others and encouraged by their appreciation of him. This is how *scientific opinion* is formed, which enforces scientific standards and regulates the distribution of professional opportunities. (1966, p. 72)

This aspect of the social structure of disciplines was much emphasized by Robert Merton (1973) and the tradition in sociology of science which he inspired.

Subsequently, though, sociologists of science pushed beyond the Mertonian tradition to address how the institutional structure of disciplines influences the content of scientific research by, for example, focusing a particular scientist's endeavors. Rosenberg commented,

> It is the discipline that ultimately shapes the scholar's vocational identity. The confraternity of his acknowledged peers defines the scholar's aspirations, sets appropriate problems, and provides the intellectual tools with which to address them; finally, it is the discipline that rewards intellectual achievement. (1979, p. 444)

Contemporary sociologists emphasize that the factors that shape a scientist's identity are not limited to ideas internal to the science itself but can include those of the broader society. Thus, Robert Kohler characterized such